Did you know that the standing army maintained by the white ants of Ceylon practices a sort of chemical warfare against its insect enemies? The white ants squirt a secretion in the faces of other ants which is said to drive them crazy.

It is said that the ancient palaces of Rome show traces of elevators—vertical passages—the stones on the landings being worn deep by the ropes used to hoist the primitive elevators of those days.

The Bhandardara irrigation dam near Nasik, India, will soon be completed and will be 250 feet high, storing the greatest depth of water of any dam yet completed.

BRINGING MORE DAYLIGHT INTO INDUSTRIAL BUILDINGS.

Dr. George M. Price, writing on "The Importance of Light in Factories," in "The Modern Factory," states: "Light is an essential working condition in all industrial establishments, and is also of paramount influence in the preservation of the health of the workers. There is no condition within industrial establishments to which so little attention is given as proper lighting and illumination. Especially is this the case in many of the factories in the United States. A prominent investigator, who had extensive opportunities to make observations of industrial establishments in Europe as well as in America, states: "I have seen so many mills and other works miserably lighted, that bad light is the most conspicuous and general defect of American factory premises."

"My own investigations for the New York State Factory Commission support this view. In these investigations it was found that 36.7% of the laundries inspected, 49.2% of the candy factories, 48.4% of the printing places, 50% of the chemical establishments, were inadequate'y lighted. There was hardly a trade investigated without finding a large number of inadequately lighted establishments."

Inadequate and defective lighting of industrial buildings is not confined to the establishments in New York State alone. The same conditions prevail in most sections of the country.

Such conditions as mentioned above are entirely opposed to the laws of health, sanitation and efficiency. Wherever poor lighting conditions prevail, there must be a corresponding loss of efficiency and output both in quality and in quantity. American industry is not using nearly enough daylight and sunlight in its buildings. Every endeavor should be made to use as much as possible of daylight for lighting purposes. To obtain this it is of course necessary that the rays of daylight and sunlight are permitted to enter the interior of the buildings as freely as possible, with the important modification that the direct rays of the sun must be properly diffused to prevent glare and eyestrain. A glass especially made for this purpose is known as Factrolite, and is recommended for the windows of industrial plants. Windows should be kept clean if the maximum amount of daylight is to pass through the glass, but the effort will be well repaid by the benefits secured.

In the presence of poor lighting, we cannot expect men to work with the same enthusiasm as when a well lighted working place has been provided. The physical surroundings have a deep effect upon the sentiments of the employes, and where bad working conditions are allowed to prevail, there is invariably a lessening of morale and satisfaction created thereby. Neglecting to utilize what nature has so bounteously provided, daylight, and which is so essential toward industrial efficiency, we have an instance of wastefulness, but now that the importance of good lighting is becoming recognized, undoubtedly more attention will be given by progressive industrial employers to furnishing the means which are essential for their workers to secure and maintain the efficiency, which counts for so much in the success of any industrial concern in this competitive age.

If you are interested in the distribution of light through Factrolite, we will send you a copy of Laboratory Report—"Factrolited."

MISSISSIPPI WIRE GLASS CO.,
220 Fifth Avenue,
St. Louis. New York. Chicago.
No. 3.

The Tomb of Tutankhamen

More than three thousand years have passed since Tutankhamen supervised the construction of his rock-hewn tomb. After he died, his paraphernalia of pomp and pleasure, war and worship, were laid away with him, because in those days the tomb was regarded as the eternal abode of the soul.

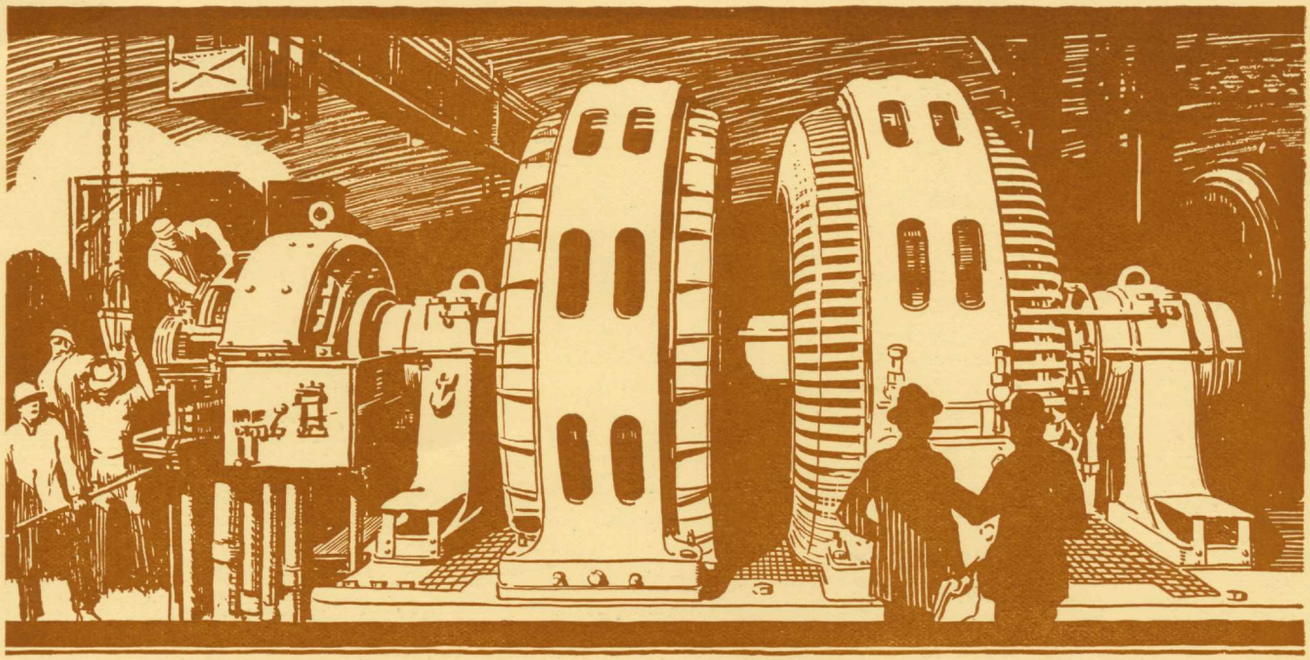
In Tutankhamen's time, gold, silver, copper, lead, and tin were mined; bronze vessels and tools were wrought and cast; large blocks of stone were quarried and long underground passages were driven.

These early Egyptians broke rock by driving wooden wedges into grooves chipped out with bronze tools. The swelling of the wedges, after they were wet with water, was sufficient to crack the stone. Thus they tunnelled the tomb of Tutankhamen.

The Pharaohs of Egypt had countless slaves at their command. Therefore, they disregarded labor costs. Far different is the situation of the modern miner, quarryman, or contractor. Now, even the concentrated energy of dynamite—the great labor-saver of this age—must be carefully conserved.

For work on which it is suited, there is no dynamite more economical than Hercules Special No. 1. It averages about one-third more cartridges per box than 40 percent dynamite, which it frequently replaces, cartridge for cartridge, thereby reducing explosives costs more than 25 percent. Hercules Special No. 1 contains nothing but the highest grade of standard materials and, on many kinds of work, has thoroughly proved its dependability.

Our booklet, *Volume Vs. Weight,* contains complete information on Hercules Special No. 1. Our general catalog is called *Hercules Products.* Write to our advertising department, 939 King Street, Wilmington, Delaware, for free copies.



Real Service Must Be Engineered

Many of the men whose names are writ large in engineering history are design engineers; men like Westinghouse, Lamme, Stanley, Hodgkinson, Tesla, Shallenberger. Their inventions have the quality of usefulness, of reliability, of productability; which is an involved way, perhaps, of saying that they have the primary requisite of all really great inventions: *Serviceability.*

Engineering history abounds in instances of near-genius that produced no product, and of great developments that never reached completion; and most of these instances are explained by the lack, somewhere in the system, of that ability to give real Service.

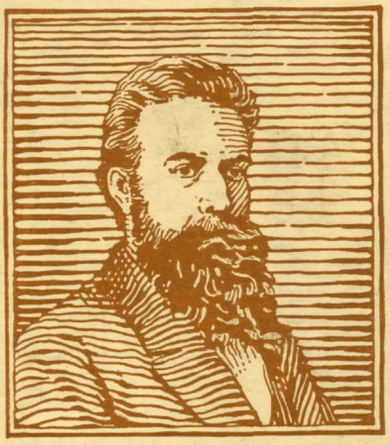
Service, in a machine or a system, or wherever you find it, is not there by accident but because it was incorporated by men who understood what was required and knew how to provide it.

Much more is required of the designer than facility in calculation and mastery of theory. He must have first hand and thorough familiarity with manufacturing operations and with commercial and operating conditions. It takes more than mere ingenuity and inventiveness to design apparatus that will be really serviceable and will "stay put."

The design engineer, in the Westinghouse plan, is responsible for the performance of the finished product. He cannot possibly have the proper understanding of operation unless he operates and tests, unless he spends time and thought in investigation and study, not in the laboratory or drawing room, but right on the operating job. Here, most of his ideas will develop; and here he will see and prepare for all the different things which the product will later have to encounter. Then when he comes to put his creations on paper, his calculations will be necessary and helpful to check the conclusions which he has reached, and this right use of them requires training and a high degree of understanding. This proper balance of the physical and mathematical conception of things is what constitutes engineering judgement.

It should be thoroughly understood that the primary function of the design engineer is the conception and the production of new or improved apparatus, and familiarity with the practical is essential to the proper discharge of this duty.

It is this view of designing that makes this branch of Westinghouse engineering so important, so effective, and so productive of real developments.



WILLIAM KONRAD ROENTGEN
1845-1923

Born in Lennep, Prussia. Educated at Zurich. Awarded the Rumford Medal of the Royal Society in 1896 jointly with Philip Lenard for discovery of X-rays. Won the Nobel Prize in physics in 1901.

"I did not think— I investigated"

One day in 1895, Roentgen noticed that a cardboard coated with fluorescent material glowed while a nearby Pluecker tube was in action. "What did you think?" an English scientist asked him. "I did not think; I investigated," was the reply.

Roentgen covered the tube with black paper. Still the cardboard glowed. He took photographs through a pine door and discovered on them a white band corresponding to the lead beading on the door. His investigation led to the discovery of X-rays.

Roentgen's rays have proved an inestimable boon to humanity. In the hands of doctor and surgeon they are saving life and reducing suffering. In the hands of the scientist they are yielding new knowledge—even of the arrangement and structure of atoms. The Research Laboratories of the General Electric Company have contributed greatly to these ends by developing more powerful and efficacious X-ray tubes.

The General Electric Company manufactures everything electric—from fans to powerful locomotives, from tiny lamps to mighty power plants. Its products are used around the world.

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